

Docket No. 05165.1280
Application No. 10/759,249
Customer No. 30734

Patent

Amendments to the Drawings:

In light of this amendment, Applicants respectfully requests that the amendment to drawings being entered and the objection to the drawings be removed.

Attachment: Replacement Sheet

REMARKS/ARGUMENTS

Claims 1-23 are pending in this application. By this amendment, claims 3, 11-12 and 22 are amended to correct misspellings. The drawings and specification are similarly corrected. No new matter has been added.

MATTERS OF FORM

The Office Action objects to FIG. 7 for misspelling of the frequency metric. Applicants have submitted a corrected Fig. 7 to obviate this objection.

The Office Action objects to the misspelling of Gunnplexer. Applicants have amended the specification to correct this misspelling. Accordingly, the withdrawal of this rejection is respectfully requested.

The Office Action objects to claims 1, 3, 11-12, and 22 for informalities. These claims have been amended to obviate these objections.

PATENTABLE SUBJECT MATTER

The Office Action rejects claims 1, 2, 6, 9, 11, 13, 18 and 20 under 25 U.S.C. §102(b) over Fathi, et al. (U.S. Patent No. 5,648,038). This rejection is respectfully traversed.

Applicants' independent claim 1 recites a thickness measurement system, comprising: an electromagnetic cavity resonator having an exposed side; a signal decoupler coupled to the cavity resonator; an signal amplitude detector coupled to the decoupler; a frequency signal generator coupled to the processing unit and to the decoupler; a processing unit coupled to the

amplitude detector that processes; and a correlating algorithm correlating a resonant frequency shift detected by the amplitude detector to a surface thickness of a sample being measured.

Applicants' independent claim 11 recites a thickness measurement system, comprising: a resonating means for resonating an electromagnetic signal, having an exposed side; a decoupler means for decoupling signals from the resonating means, and connected to the resonating means; a signal detecting means for detecting an amplitude of signals from the decoupler means, and connected to the decoupler means; a frequency signal generating means for generating frequency signals, coupled to the processing means and the decoupler means; and a processing means for processing, coupled to the signal detecting means, or having; correlating means for correlating a resonant frequency shift detected by the detecting means to a surface thickness of a sample being measured.

In contrast, Fathi, et al. is directed to "closed" microwave cavity system for monitoring or detecting the characteristics of a work piece within the microwave chamber. In particular, Fathi uses a reference work piece whose signature curves are generated by placing the work piece within an autoclave and radiating the entire work piece with variable frequency microwave energy. By determining the "signature" end curves, subsequent process/curing times can be precisely controlled to increase the efficiency of the production rate. See col. 5, lines 5-20, for example.

As can be readily apparent from Fathi's disclosure, his process is used for determining the amount of "curing" needed in an epoxy work piece positioned in the center of the cavity as is shown in FIGS. 3A-3B and cols. 5, lines 2-24, for example. The work pieces 4 and 5 are hosted within multiple microwave cavities 40. Additionally, FIGS. 7-9 illustrate the signature

curves for different degrees of curing in the epoxy work piece. See col. 7, lines 21-41, for example. Fathi does not utilize his system for thickness measurement.

Accordingly, Fathi does not disclose at least an electromagnetic cavity resonator having an exposed side or detecting a surface thickness of a sample being measured, as recited in Applicants' independent claims. Therefore, Fathi does not disclose or suggest all the features of Applicants' invention.

Claims 2, 6 and 9 depend from claim 1; claims 13, 18 and 20 depend from claim 11. Accordingly, for at least the above reasons Applicants respectfully request the withdrawal of this rejection.

The Office Action rejects claims 3, 5, 7, 10, 12, 15, 17 and 19 under 35 U.S.C. §103(a) over Fathi, in view of Little, Jr., (U.S. Patent No. 6,359,446). This rejection is respectfully traversed.

As admitted in the Office Action, Little, Jr. is offered to disclose the use of a Gunnplexer or a Gunn Diode. However, notwithstanding the above, Applicants respectfully submit that Little, Jr. does not supply the subject matter lacking in Fathi, as discussed above. Specifically, Little, Jr. is directed to utilizing interference patterns to increase the signal to noise ratio of microwave energy impinging upon a surface. The extensive discussion of the prior art described in col. 3, lines 1-30, for example, pertain to the use of microwave energy to determine the change of the thickness of an object or cracks therein. As clearly stated in col. 3, lines 23-62, Little, Jr., uses a combination of reflective and reference microwave and an interference pattern derived therein to determine variations in the subject material. There is no discussion or suggestion in any of the descriptions provided by Little, Jr. related to absolute thickness determinations.

Accordingly, it is readily apparent that Little, Jr., does not supply the subject matter lacking in Fathi. Therefore, Fathi and Little, Jr., individually or in combination, do not disclose or suggest all the features of Applicants' independent claims 1 and 11. Since claims 3, 5, 7 and 10 depend from claim 11; and claims 12, 15, 17 and 19 depend from claim 11, Applicants respectfully request the withdrawal of this rejection.

The Office Action rejects claims 4 and 16 under 35 U.S.C. §103(a) in view of Dorothy, et al. (U.S. Patent No. 5,563,505. This rejection is respectfully traversed.

As admitted in the Office Action, Dorothy is offered to disclose a suction assembly to the surface of a material. However, in addition to not supplying the subject matter lacking in Fathi, as disclosed above, Dorothy also requires a sapphire boundary to be positioned between contacting to discrete films of at least one superconducting material. A first resonator is shown in FIGS. 1(A) and 1(D); and the second resonator is shown in FIGS. 7 (A) and (B). Multiple resonators are utilized in a sapphire rod having a specific dielectric constant is attached to a film-sapphire-structure. See col. 5, lines 1-40, for example.

The invention disclosed by Dorothy, therefore determines superconductor thin film parameters such as critical temperature, surface resistance, density, critical magnetic field, etc. There is no suggestion or discussion in Dorothy regarding determining the thickness of a superconducting film. Additionally, there is no discussion or suggestion in Dorothy regarding an open ended cavity resonator. Thus, Dorothy does not supply the subject matter lacking in Fathi. Accordingly, Fathi and Dorothy, individually and in combination, do not disclose or suggest all the features in Applicants' invention.

Claim 4 depends from claim 1; and claim 16 depends from claim 11. Thus, for at least the above reasons, Applicants respectfully request the withdrawal of this rejection.

The Office Action rejects claim 14 under 35 U.S.C. §103(a) over Fathi in view of Little, Jr., and further in view of the Electrical Engineering Dictionary. This rejection is respectfully traversed.

The Electrical Engineering Dictionary discloses a varactor comprising Schottky diodes. Since there is no discussion in the Electrical Engineering Dictionary regarding the features lacking in Fathi and Little, Jr., as discussed above. Fathi, Little, Jr., and the Electrical Engineering Dictionary, individually or in combination, do not disclose or suggest all the claimed features of Applicants' invention.

Since claim 14 depends from claim 11, Applicants respectfully request the withdrawal of this rejection.

The Office Action rejects claims 22 and 23 under 35 U.S.C. §103(a) over Anderson (U.S. Patent No. 6,184,694) in view of Little, Jr., and Fathi. This rejection is respectfully traversed.

Applicants' independent claim 22 recites a method for thickness measurement, comprising the steps of: abutting an open faced electromagnetic cavity resonator to a sample having a film thickness; sweeping frequencies in the cavity resonator using a signal generator having a Gunnplexer; detecting a resonant frequency of the cavity resonator using a reflected energy detector; and determining the thickness of the film from a correlation of a shift of the resonant frequency.

Anderson discloses a multiple cavity resonator system utilizing a reference cavity and a measurement cavity. Anderson is simply the prior art discussed in the Applicants' specification. Since Anderson requires a reference cavity and a measurement cavity and a diode detector X1, modification to have a single resonant cavity would render Anderson inoperative for its intended purpose. Similarly, Fathi requires a closed microwave cavity for a proper operation. Similarly,

Little, Jr., is deficient in that it is directed to the changes of properties rather than in an absolute thickness. As is discussed above, none of these references have sufficient teachings or motivation to allow one of ordinary skill in the art to combine them to render obvious the Applicants' claimed invention. In fact, given that these references are silent with respect to specific detail described in Applicants' invention, and that modification of these features would render these references operable for their intended purposes, Applicants respectfully submit that, individually or in combination, Anderson, Little, Jr., and Fathi, would not disclose or suggest all the claimed features of Applicant's invention.

Claim 23 depends from claim 22. Therefore, for at least the above reasons, Applicants respectfully request the withdrawal of this rejection.

CONCLUSION

In view of the above, Applicants respectfully submit that this application is in condition for allowance. Should the Examiner believe that anything further is necessary to place this application in an even better condition for allowance, the Examiner is invited to contact the undersigned representative at the telephone number listed below.

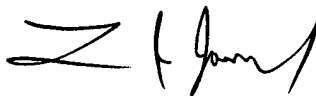
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In the event this paper is not timely filed, Applicants petition for an appropriate extension of time. Please charge any fee deficiencies or credit any overpayments to Deposit Account No. 50-2036.

Respectfully submitted,

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